# EXHIBIT C

# Longhorn Power Management: Foundation UX (M5)

**How we'll beat the always on, plugged into the wall workaround with Longhorn's power management features.**

## Closed for M5

## Overview & Scope

When running on battery power, Longhorn will display the battery status and other vital power management information in a prominently displayed Power Bar Part. When the Sidebar is minimized, the Bar Part will move to the System Tray, but will be wider than the standard 16 x 16 icon to be recognizable and provide at-a-glance status. Out of the box, the Longhorn Kernel Power Manager (KPM) will automatically and aggressively throttle and turn off idle devices to give the user hours of battery life, without any fine tuning on her part. For example, it will automatically turn off the internal display after a minute or so of inactivity. However, the user could be reading a document, projecting a spreadsheet or doing some other task that looks to the system like inactivity. To give her full and final control over system availability, the system will notify her in advance, using the Longhorn notifications infrastructure, of upcoming automatic actions. From the notification she will be able to temporarily disable the action or change the settings that control it.

## Problems & Opportunities

NOTE TO REVIEWERS: The section below describes current problems, opportunities and feature goals that we will hit by Longhorn RTM. It is not scoped on any individual LH milestone.

When the Sidebar is closed, the PM Tile will move to the System Tray, above the "fold". If the Tile is set to use the Large version of the battery icon, it will continue to display this icon in an expanded 16 w x 48 h px rect. As the screenshot below shows, in this configuration, the Tile has the same appearance in the Tray as it does when the Sidebar is open and at minimum width. This behavior will greatly improve at-a-glance recognition, regardless of whether the Sidebar is open or closed.

**Figure 10 – PM Tile in the System Tray**

**Issue: Need a commitment from DMatt for the expanded System Tray rect.**

Dave has documented our request in his M5 spec, but has not yet committed to it as part of the booked plan. They plan to decide in M6 whether our request makes the bar.

If the user explicitly chooses the Small version of the battery icon, the PM Tile will show the Small icon in the Tray when the Sidebar is closed.

**Tray Icon Mouse Event Handling**

When the PM Tile is minimized to the Tray, it will handle mouse events exactly the same way as it does when the Sidebar is up (see Table 3). It will pop up the flyout pop up the flyout above the Tray in response to clicks anywhere in its bounding rect. If the user hovers the cursor over its bounding rect, it will show the same battery status tooltip described in Table 4.

## Tile Properties

The PM Tile will have a simple Properties page that the user tunnels to from the Options menu. In M5, the Properties page will have the settings shown below.
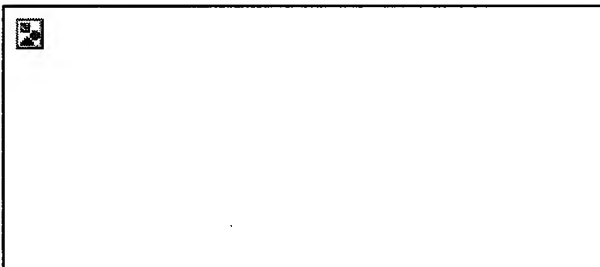
**Figure 11 – Tile Properties UI**

The table below describes how each setting affects the Tile behavior if the user clicks the OK button in the Properties page. If she clicks Cancel, the Tile will dismiss the Properties page without changing any settings.

| Group | Label | Tile Behavior if Set | Tile Behavior if Cleared |
|---|---|---|---|
| Icon | Large | Displays Large battery icon in Sidebar and Tray | n/a |
| Icon | Small | Displays Small battery icon at all times. Time and percentage remaining are displayed in Tooltip. | n/a |
| Information | Show time remaining | Displays time remaining in battery meter if Large version selected. If Small version selected, time remaining will only be | Tile does not show time remaining, even if Large icon selected. |

| | | shown in Tooltip. | |
|---|---|---|---|
| Information | Show percentage remaining | Displays percentage remaining as gas gauge when Tile body visible. | Tile does not display gas gauge. |
| n/a | Hide the battery meter... | Tile automatically hides itself when the timer set by the value in the edit control expires. | Tile does not hide automatically. |

**Table 7 – Tile Options Logic**

## Notifications

We've learned from past experience with Outlook, Messenger and Windows XP that there is a very fine line between effective and ineffective notifications. The Outlook 11 and Messenger notifications generally fall on the effective side because they help the user decide at-a-glance whether to pay attention to an incoming communication. The XP notifications generally fall on the ineffective side because there are too many of them and they usually signal something unimportant. To avoid falling on the ineffective side of the line, the power management notifications will follow the five criteria listed earlier in the spec. In M5, we will test the effectiveness of notifications that follow these criteria by limiting them to the events listed in the table below.

| Event | Category | Purpose | New for LH? | Priority |
|---|---|---|---|---|
| Low battery alarm level reached | Alarms | Warns the user that battery is running low to help her prevent work interruption and/or data loss | No | 0 |
| Critical battery alarm level reached | Alarms | Warns the user that battery is at critical and hibernation is about to happen. | No | 0 |
| Display off idle timer "about" to expire | Power Savers | Alerts the user that the system will turn off the display soon and gives her the option to disable the display timer | Yes | 1 |
| Maximum performance setting selected on switch to battery power | Assistance | Informs the user that the max perf setting is selected and gives her the option to switch to a better setting | Yes | 2 |

**Table 8 – M5 Power Management Notifications**

When one of the events listed in the tables above occurs, a standard Longhorn notification toast will pop up as close as possible to the global x, y origin of the PM Tile. For example, if the Tile is in the System Tray because the Sidebar is down, the toast will appear above the Tray, aligned as closely as possible with the Tile icon. This spatial proximity will help the user link the notification to power related status and settings. Under the hood, the Avalon app that drives the Tile will be the actual source of the notifications. It will declare one notification source in its manifest for each category listed in the table above. In other words, the NotificationCategory property in the declarations will match the strings in the table, meaning that a full text search of the manifest file for the key word 'Assistance' will turn up one hit. The NotificationSource property will be set to "Power Settings".

NOTE: These strings are placeholders pending UA and Usability review and input.

The Tile app will also be the receiver for the kernel events needed to determine whether the trigger conditions for the notification have been met. When a set of trigger conditions are met, it will call into the Longhorn InfoAgent to display the notification. The Tile will add the Critical Battery and Display Idle Timer notifications to the user's exception list so that she will still be notified by default in Do Not Disturb mode. The Tile will register the Low Battery notification, but will turn it off by default because the new battery meter does a much better job of letting the user know the battery is running low. If the user prefers both alerts, as in previous OS releases, she can turn on the Low Battery notification in the LH Notifications Options UI. If she does not want the Critical Battery notification, Display Idle Timer or both to pop up in DnD mode, she can remove them from the exception list.